In the latter island is the last active volcano of the group, Mauna Loa with its two creaters, of which the well-known crater of Kilauea is the great sight of the islands and visited constantly by tourists from all parts of the world.

A few days after my return to Honolulu from Kauai, and six weeks from my first arrival there, I boarded the Monowai, the through Australian steamer bound for San Francisco, which was reached in due season after an uneventful passage. And so ended my first trip to the tropics.

Leland Stanford Junior University.

Botanical papers presented at the New Orleans meeting of the American Association of Agricultural Colleges and Experiment Stations.

L. H. PAMMEL.

The botanists in attendance at the New Orleans meeting were not numerous, and the same may be said of the horticulturists. On invitation of the botanists, the horticulturists met with them. The association later united the sections of botany and horticulture.

Papers enough were presented to take at least a forenoon and an afternoon, but owing to the meetings of the general sessions it was impossible to get all of the members together at any one time. The meetings at different times could only be an hour long. The meeting on Thursday morning was devoted to the important topic of the station and laboratory exhibit at the World's Columbian exposition, which was discussed by Dr. True and Prof. Tracy.

It would seem that more time should be given to a discussion of methods of investigation and more time allotted to the different sections. Botanical investigations appear to the writer to be an important part of station work.

The following papers were presented:

BYRON D. HALSTED: *Quince diseases.*—The following fungous troubles of the quince fruit were treated, namely: The quince rust (*Ræstelia aurantiaca* Pk.); the fruit spot (*Entomosporium maculatum* Lév.); the black rot of the quince (*Sphæropsis malorum* Pk.); the quince pale rot (*Phoma*

Cydoniæ Sacc.)?; the ripe rot of the quince (*Glœosporium fructigenum* Berk.), and the quince blotch, due to a fungus the life history of which is not yet worked out and whose affinities are obscure.

The black rot is the same as that of the apple and the fact that this was unusually destructive seems due to there being a large apple tree among the quince trees with the ground beneath it covered with fruit decaying with the sphæropsis. The pale rot may prove to be a new species, as *Phoma Cydoniae* Sacc. has a very incomplete description and is recorded only for leaves. By inoculations it was shown that the ripe rot is the same as that of the apple and grape, namely, *Glœosporium fructigenum* Berk. These various decays were photographed.

BYRON D. HALSTED: *New Jersey Peronosporeæ.*—After recording the substance of the field notes made upon the various species, stress was laid upon the fact that during the autumn months, which were unusually dry, there was more than the ordinary amount of the members of the genus Cystopus. While the peronosporas prefer a wet season, the white moulds seem to thrive best when the weather is dry. In a further study of the methods that these mildews have for passing the winter, it was found that some species grow upon the fruits of the host and doubtless, as in *Ipomœa hederacea*, the filaments penetrate the seeds, and when the latter germinate the parasite develops with the host. Large numbers of small young seedlings badly affected in the cotyledons, and roots even, were taken.

The importance of making field notes upon the prevalence of particular fungous parasites extending over many seasons was urged in the paper.

BYRON D. HALSTED: *Weed seeds.*—Samples of a collection of weed seeds then being made by the writer were exhibited, for an account of which, see this journal, XVII, 427.

GEORGE F. ATKINSON: *On a method of obtaining a pure culture of Pammel's fungus of Texas root rot of cotton.*—Printed in full in this issue.

GEORGE F. ATKINSON: *A new "damping off" fungus.*—"Damping off" has usually been attributed to *Pythium De Baryanum*, but Atkinson found in young cotton affected with what is commonly called "sore shin" among planters, *Rhizopus nigricans*, *Fusarium*, and a non-fruiting form of a fungus

having threads from 9μ to 11μ in diameter and 100μ to 200μ in length, colorless at first, finally becoming brown. The fungus was isolated and grown in acid nutrient agar. Plants grown in sterilized soil when inoculated with this fungus dropped over and had this characteristic fungus. The same fungus was obtained from the inoculated plants. The author concludes that probably much of the damage attributed to *Pythium* is caused by this fungus.

L. R. JONES: *The antagonistic relations of certain potato diseases.*—Three diseases have been observed in Vermont, (1) blight and rot, *(Phytophthora infestans)*; (2) the macrosporium disease; (3) a bacterial disease. The phytophthora disease, and the macrosporium disease, or a disease associated with Macrosporium has been very common in Vermont in 1890, 1891 and 1892. He has watched these diseases and noted that there is an annual struggle between them. "It is comparatively rare that a tuber affected by the characteristic dry rot of Phytophthora is found among the tubers where the vine is destroyed by the new disease." The author concludes that if the climatic conditions remain as they have during the past three years in Vermont and only early potatoes are planted, the new disease would tend to exterminate the *Phytopthora.*

L. H. PAMMEL: *Preliminary notes on a rutabaga and turnip rot.*—The disease is not associated with any of the higher fungi, but there are present in the tissues numerous bacteria. Cultures of several species have been obtained, and one of these apparently produces a rotting similar to those found in the field. The inoculated plants were in the field so the demonstration is by no means conclusive. More work is under way. A curious feature in connection with the disease is that the dry weather in September not only checked the disease completely, but such plants as had rotted almost entirely recovered by forming a corky layer around the diseased portions.

L. H. PAMMEL: *Some experiments in the prevention of Cercospora Ribis and Cylindrosporium Padi.*—The author detailed some experiments in treating these diseases with ammoniacal carbonate of copper, Bordeaux mixture, and sulphosteatite. Bordeaux mixture proved most effective, the plants having retained their foliage well into October. In 1891 ammoniacal carbonate of copper gave good results, but

the season was more favorable. In seasons like 1892 with an abundance of rain the sulphosteatite and ammoniacal carbonate of copper wash off much easier then the Bordeaux mixture.

L. H. PAMMEL: *Relation of frost to certain plants.*—This paper gave a record of the exact temperature at which certain plants were killed. In several cases like castor-oil bean the lower leaves were affected while the upper long remained green. So also *Zea Mays*, *Scabiosa atropurpurea*, *Marrubium vulgare*, *Nepeta cataria*, *Phlox Drummondii* and *Cosmos* are quite resistant to frost.

S. A. BEACH: *Bean anthracnose and its treatment.*—It has been known for some time that when anthracnosed seed is planted the disease most frequently is found on the cotyledons as soon as they push through the surface of the soil, but it may be found on any other part of the plant above the roots. Experiments made in treating the seed and plants as compared with clean seed show that the selection of clean seed is the most important and effective method of securing healthy plants.

Iowa Agricultural College, Ames.

BRIEFER ARTICLES.

The use of blue-print paper in recording root curvatures.—The common blue print paper so much used by photographers, architects, and mechanical engineers, is not, so far as we are aware, of frequent use in botanical laboratories; yet it may be employed for a number of purposes with a considerable saving of time. We have found it particularly valuable in printing the angles of both primary and secondary roots that have been subjected to galvanic currents, and also in printing the geotropic bendings of secondary roots, to make an accurate drawing of which would require considerable time; whereas an exact reproduction can be obtained in a very few minutes. This is most easily accomplished if we have either an air or water culture, by fastening a piece of the sensitive paper to the outside of the glass jar in which the plants are growing, and exposing them for a few moments to sunlight. It is better still, especially if the plants are cultivated in cylindrical jars, to transfer them to a rectangular glass jar filled with water, and of sufficient size as to allow the secondary roots to main-